Imipenem

Imipenem is a beta lactamase resistant antibiotic with a broad spectrum of activity. It is a type of carbapenem that inhibits cell wall synthesis. It is always administered intravenously with cilastatin, which is an inhibitor of renal dehydropeptidase I. Without cilastatin, imipenem is susceptible to degradation by renal dehydropeptidase I in the renal tubules. This wide spectrum antibiotic can be used for gram positives, gram negatives, aerobes and anaerobes. It is especially used for pseudomonas and enterococcus infections, but is not effective against methicillin resistant staphylococcus aureus (MRSA). Clinically, imipenem's use is restricted to special cases to avoid development of bacterial resistance. This antibiotic also has many side effects such as nausea, vomiting, and seizures.Meropenem is another carbapenem with activity similar to imipenem but has reduced risk of seizures and does not require co-administration of cilastatin because it not degraded by dehydropeptidase I.



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Mechanism

Resistant to Beta-Lactamases
Resisting (B lac) Black Beta-fish wearing Resistance-bandana
Carbapenem antibiotics like imipenem and meropenem are resistant to beta-lactamases and can therefore cover a wide spectrum of bacterial infections.

Broad Spectrum
Broad Spectrum of Colors
Carbapenems like imipenem and meropenem cover a broad spectrum of bacteria, such as gram-positives, gram-negatives, aerobes, and anaerobes.

Indications

Anaerobes
Ant-robe
Anaerobic bacteria are bacteria that do not require oxygen for growth. This antibiotic can be used for anaerobic organisms.

Gram-Negative Rods
Graham-cracker Negative-devil with Rod
Gram-negative rods are bacteria that stain gram-negative due to a relatively thin peptidoglycan layer in the cell wall with a rod shape. Imipenem covers a broad spectrum of bacteria, including gram-negative rods.

Gram-Positive Cocci
Graham-cracker Positive-angel with Cock-eyes
Gram-positive cocci are gram-positive organisms that absorb crystal violet on gram stain due to a thick peptidoglycan layer with a spherical shape. Gram-positive cocci include Staphylococcus and Streptococcus species. Imipenem covers a broad spectrum of bacteria, including gram-positive cocci.

Must Administer with Cilastatin
Silly-string
Imipenem can be degraded by renal dehydropeptidase I in the renal tubules and, therefore, requires co-administration with cilastatin, a dehydropeptidase I inhibitor. Meropenem, however, does not require cilastatin because it is not degraded by dehydropeptidase I.

Cilastatin is Inhibitor of Renal Dehydropeptidase I
Silly-string Inhibiting Kidney at Hydrant-pep-D
Cilastatin is always given together with imipenem to prevent imipenem's degradation by renal dehydropeptidase I.

Side Effects

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Diarrhea
Toilet
Carbapenems like imipenem and meropenem are known to cause GI distress, including diarrhea, nausea, and vomiting.

Skin Rash
Skin Rash-being-examined-by-dermatolgoist
Skin rash is another occasional adverse effect caused by carbapenem antibiotics like imipenem and meropenem.

Seizures
Caesar
Seizures are a more serious adverse effect that can occur with the use of imipenem. However, meropenem has a much-reduced potential for this side effect compared to imipenem.

Considerations

Meropenem
Mirror-penny
Meropenem is another carbapenem with activity similar to imipenem but has a reduced risk of seizures and does not require co-administration of cilastatin because it is not degraded by dehydropeptidase I.

Stable to Dehydropeptidase I
Unaffected by Renal-hydrant with Peptidase-logo
Meropenem, unlike imipenem, is stable to dehydropeptidase I and, therefore, does not require co-administration of cilastatin.

Reduced Risk of Seizures (Non-Seizure Causing)
Nun Caesar
Meropenem has a reduced risk of CNS toxicity or seizures as compared to imipenem.

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